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VOLUME XXII *Third Quarter, 1955* NUMBER 3

CONTENTS

126...From Your President's Pen.....*Willard T. Hunnicutt*

127...Program, Annual Meeting, San Francisco

132...Oral Habits } *Maury Massler, Hugh Kopel,*
141...The Labial Frenum } *Morris Kelner and Ray Werther*

144...A Classification and Treatment for Traumatized Anterior Teeth
Charles A. Sweet, Jr.

150...Unit News

151...Does Functional Effort Affect Caries Activity?
H. H. Neumann and N. A. DiSalvo

154...Prosthetic Dentistry for Children.....*Donald B. Chatterton*

161...State Unit Officers

from your president's pen

San Francisco—cable cars—the Top o' the Mark—grim Alcatraz—Golden Gate Bridge —the Bay—Chinatown—Fisherman's Wharf—A.S.D.C. in session!

Our very efficient Annual Meeting Committee has arranged outstanding scientific presentations and social events to keep our members and their guests well occupied during our 1955 Convention, but there will be plenty of time during your stay in San Francisco, I hope, to permit you to learn more about this great city.

Elsewhere in this issue of our Journal and in the program of the Meeting which you have already received, you will find detailed information about the subjects to be explored and expounded by our essayists and clinicians. Certainly it is one of the finest programs ever presented to the members of the American Society of Dentistry for Children and credit is due to Charlie Sweet, Junior and his Committee members for their untiring efforts. I wish that every one of you attending the Meeting would take a moment to express your own appreciation to the committee personnel. I'm sure they will appreciate your recognition.

In this final Presidential Message, I wish to thank my fellow officers, committee members and members at large of the various State Units for their support during the past year. It has been an honor and a privilege to serve as President of the American Society of Dentistry for Children.

See you in San Francisco!

WILLARD T. HUNNICUTT

PROGRAM

SHERATON-PALACE HOTEL, SAN FRANCISCO, CALIFORNIA

FRIDAY, OCTOBER 14, 1955

DINNER MEETING OF EXECUTIVE COUNCIL

6:30 P.M.—French Parlor

SATURDAY MORNING, OCTOBER 15, 1955

REGISTRATION

8:00 A.M. to 9:00 A.M.—Lobby at Rose Room Entrance

OPENING CEREMONIES

9:00 A.M. to 9:30 A.M.—Rose Room

TELEVISION PROGRAM

Rose Room 9:30 A.M. to 12:00 Noon

9:30–10:00

Demonstrators: JOSEPH SWEET
TED GRANT

Subject: "A simplified Technique of Intra-Oral Film Placement in Children"
Demonstration on children ages four to eight of various film techniques and their results.

10:00–10:30

Demonstrators: RAY WEINHEIMER
JACK CRAMPTON

Subject: "Local Anesthesia for Children" Children ages four to eight receiving inferior alveolar block, infraorbital block, and infiltration anesthesia.

10:30–12:00

Demonstrators: JOHN TOCCHINI
ARTHUR DUGONI
CHARLES WYCOFF

Subject: "Operative Dentistry for Children"
This clinic will demonstrate the use of the rubber dam, its placement, cavity preparation, matrix placement and amalgam condensation under general anesthetic on a handicapped child.

SCIENTIFIC PROGRAM

SATURDAY AFTERNOON, OCTOBER 15, 1955

12:00 Noon to 2:00 P.M.—Cafe Garden Court

GENERAL LUNCHEON

Speaker: CLINTON T. DUFFY
Former Warden, San Quentin, author and present member of the Adult Authority, State of California
Subject: Prisons, Prisoners and Parole

2:00 P.M. to 6:00 P.M.—Rose Room

BUSINESS, STATE DELEGATE AND EXECUTIVE COUNCIL MEETING

SUNDAY MORNING, OCTOBER 16, 1955

ESSAYS

Topic: A Re-evaluation of treatment of Vital Exposed Pulps

9:00 A.M. to 9:30 A.M.—Rose Room

Speaker: JOHN SOWDEN
Subject: A Preliminary Report on the Recalcification and Sterilization of Carious Dentin.

9:35 A.M. to 10:05 A.M.—Rose Room

Speaker: MAX NACHT
Subject: Pulpless Tooth Management—A Five Year Evaluation

10:10 A.M. to 10:40 A.M.—Rose Room

Speaker: DAVID B. LAW
Subject: An Evaluation of Vital Pulpotomy Technique

10:50 A.M. to 12:00 Noon—Rose Room

PANEL DISCUSSION—(Questions from the audience will be solicited and requested)

Speakers: JOHN SOWDEN
MAX NACHT
DAVID LAW
RALPH McDONALD
Moderator: IRWIN BEECHEN

SUNDAY, OCTOBER 16, 1955

9:00 A.M. to 9:35 A.M.—Room A

Speaker: MODE PERRY
Subject: Vital Pulp Therapy

9:00 A.M. to 9:40 A.M.—Room 2127

Speaker: JEROME WEINBERG

Subject: A Method and Psychological Basis for the Management of the Child Patient.

9:50 A.M. to 10:30 A.M.—Room A

Speaker: EDWARD S. MACK
Subject: Children in a Dental Practice

SUNDAY AFTERNOON, OCTOBER 16, 1955

TABLE CLINICS

2:00 P.M. to 5:00 P.M.—Rose Room

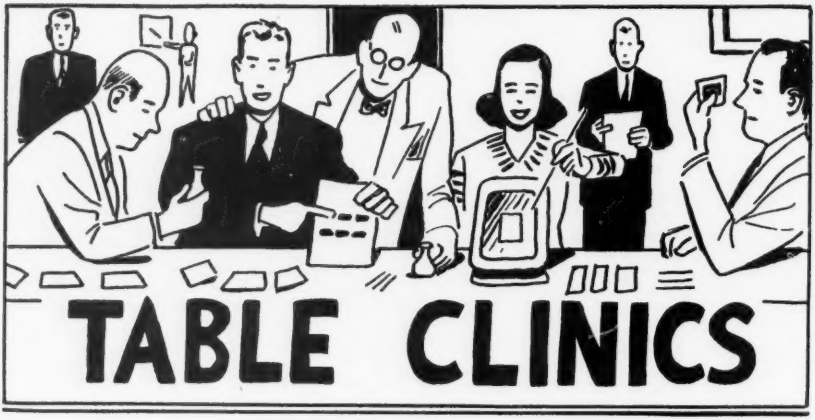
SUNDAY EVENING, OCTOBER 16, 1955
6:30 P.M. to 7:30 P.M.—Concert Room

COCKTAIL PARTY

7:30 P.M.— **Rose Room**

PRESIDENT'S BANQUET HONORING WILLARD HUNNICUTT

The Gala Social Event of the Meeting.
Entertainment by Phil Bavaro, C. B. S. Director of Music
Plus outstanding San Francisco Night Club Acts



OCTOBER 16, 1955—Rose Room.

1. LASTON, DON J., 3045 Telegraph Ave., Berkeley, Calif. Pulpal Therapy in Primary and Young Permanent Teeth.
2. MARCUS, IRWIN L., 90 Woodacre Drive, San Francisco, Calif. Indications for Early Orthodontic Treatment.
3. DEMEO, LOUIS, 6743 Foothill Blvd., Oakland, California. Modified Patterns for Pedodontic Instruments.
4. DANFORD, PORTER R., 22 Bernard, Mill Valley, California. Simple Technic for Fabrication of Tongue Inhibitor Appliance of Stainless Steel.
5. MARQUESS, PIERRE W., P.O. Box 387, Soquel, California. Relationship of the Pulp to Cavity Preparation in Primary Teeth.
6. WINTERS, LEE R., 2703 Salvio, Concord, California. Use of Diamond Instruments under Water and the Aqua Flow.
7. TOCCHINI, JOHN; WYCKOFF, CHARLES, M.D., 344 14th St., San Francisco, Calif. Dental Procedures on Handicapped Children under General Anesthesia.
8. JENKS, GORDON, 3195 Granville St., Vancouver, B.C. Routine Rubber Dam Application for Children.
9. YORSH, RALPH, 194 E. King Edward, Vancouver, B.C. Facility in Instrument Selection.
10. TAMARIN, ARNOLD, 800 Sir Francis Drake Blvd., San Anselmo, Calif. An Immediate Acrylic Space Maintainer Using Distal Shoe.
11. MATTHEW, M. A.; PORTER, D. R., Univ. of Oregon Dental School, 809 E. 6th Ave., Portland, Oregon. Analysis of Mixed Dentition Problems and Treatment for Prematurely Lost Primary Teeth.
12. HOLMES, GAY, 36 South El Camino Real, San Mateo, Calif. Restorations for Fractured Permanent Incisor Teeth.
13. JELDEN, DEAN, 313 Fourth St., Woodland, Calif. Spray-on Technic for Space Maintainers.
14. WHALLEY, SNYDER, Box 436, New Haven, Conn. Pedodontic Problems Solved.
15. FIETELSON, NORMAN, 10 Taylor Place, Westport, Conn. Amalgam Fillings in Primary Teeth.
16. JOHNSON, HUNTLEY, 2975 Telegraph Ave., Berkeley, Calif. Guidance for Labially Displaced Maxillary Incisor Teeth.
17. WAGGONER, REX R., 10742 Riverside Drive, No. Hollywood, Calif. Treatment of Fractured Anteriors with no Pulpal Involvement.
18. WHITAKER, JOHN R., 847 W. Ninth St., San Pedro, California. A Simple appliance for Opening Space.
19. SUMMERS, FRANCIS; HUCHEL, DEAN E., University of Southern California. Cavity Preparation.
20. KENDIG, GEORGE, 1502 W. Osborn Road, Phoenix, Arizona. Cavity Preparation.
21. RHATIGEN, JOHN L., 224 So. Santa Anita Ave., Arcadia, California. Ectopic Eruption.

22. PERRY, MODE, 1033 Gayley Ave., Los Angeles, California. Multiple Matrix.
23. MEINIG, GEORGE E., P.O. Box 475, Ojai, California. Save Additional Teeth.
24. HOGEBOOM, FLOYD, 3780 Wilshire Blvd., Los Angeles 5, Calif. Appliances used in Preventive Dentistry for Children.
25. STRAUSS, EDITH, SINGER, JULIAN, 5720 Wilshire Blvd., Los Angeles 36, Calif. Comminuted Fractured Incisors.
26. PLEASANT, H. A., 477 Arrowhead Ave., San Bernadino, Calif. Practical Preventive Orthodontics.
27. RUBEL, IRVING, 6135 Wilshire Blvd., Los Angeles 48, Calif. Prophylactic Orthodontic Appliances for Children.
28. HALLBERG, DICK, 415 N. Camden Drive, Beverly Hills, Calif. READ, ROBERT, 2719 W. Santa Barbara, Los Angeles 37, Calif. ANDERSON, STEWART A., 415 N. Camden Dr., Beverly Hills, Calif. General Anesthesia for Children with a Handicap.
29. JONES, R. V., 3355 4th Ave., San Diego, Calif. Treatment of Fractured Anteriors.
30. LEIB, JAMES J., 5644 Van Nuys Blvd., California. Presentation of Dentistry for Children to the Parent.
31. ECKBLOM, R., 9113 Sepulveda Blvd., Sepulveda, Calif. Treatment of Fractured Anterior using Preformed Crown.
32. COMEN, RICHARD L., 1238 Seventh Ave., Santa Monica, Calif. Space Opening Appliance.
33. KOPEL, HUGH M., 19933 Livernois Ave., Detroit 21, Michigan. Restoration of Fractured Young Permanent Anterior Teeth.
34. GARRY, JAMES, 909 N. Spadra Rd., Fullerton, Therapeutic Pulpotomy.
35. EMMERSON, CLINTON, 2716 E. Coast Highway, Corona Del Mar, Calif. Indications and Contra-Indications for the use of Calcium Hydroxide in Pulpal Treatment.
36. ANDREWS, ROBERT G., 1867 Newport Blvd., Costa Mesa, Calif. Rubber Dam Application.
37. ISRAEL, WALTER L., 1601 N. Broadway, Santa Ana, Matrices.
38. TAPPER, IRVING B., 810 Rose Bldg., Cleveland, Ohio. Restoring the Fractured Anteriors in One Sitting.
39. San Mateo County Pedodontic Study Club, Pedodontics in the General Practice.
40. LINDAHL, ROY L., Univ. of North Carolina. The Presentation of the Pedodontic Diagnosis and Treatment plan to the Parent.
41. SULON, EVA, Burlingame, Calif. Replacing Primary Teeth with Acrylic Dentures.
42. ASKINL, CHARLES; STANTON, EMMETT, College of Physicians & Surgeons Pedodontic Technics as taught at the College of Physicians & Surgeons.
43. MANDLER, WALTER, SAN JOSE, College of P&S Photography in the Practice of Dentistry for Children.
44. ANDERSON, AL, San Diego, California. Practical Method of Teaching Caries Prevention to Parents.
45. TAANO, GENE; INGLIS, JIM, 702 Webster, Palo Alto, Calif. Emergency Immediate Treatment for Fractured Permanent Anterior Teeth.
46. DAMELE, JOE; WARDEN, CLAUDE, 2940 Summitt, Oakland, Calif. Simplified Technic for the Inhibition of Habits and Correction of Cross-bite.
47. RANDOL, ED., 3 Elm, Kentfield, Calif. "Pedorthodontics"
48. WYLIE, CLYDE, 450 Sutter Bldg., Habit Correction Without the Aid of Appliances.
49. HOPKINS, WM. L., 35 Renato Court, Redwood City, Calif. A Method of Correcting Simple Crossbites.
50. FLEEGE, HERBERT W., 710 4th & Pike Bldg., Seattle, Wash. High Speed Class II Cavity Preparation in the Primary Teeth.
51. GRAHAM, J. WAYNE, 8044 35th North East, Seattle, Wash. A Parent Education Program.
52. HOFFMAN, JACK, 989 Main St., Santa Clara, Calif. A Method of Treatment of Bicuspids Impacted due to Premature loss of Primary Molars.
53. CHATTERTON, DON, 3344 4th Ave., San Diego, California. Matrix Retention For Silicates.
54. NORTON, HAYWOOD F., 2434 Haste St., Berkeley, Calif. Calcium Hydroxide Pulpal Therapy.

Oral Habits

Editor's note:

The accompanying articles on Oral Habits and the Labial Frenum are a Committee Report presented as part of the study project for 1954 of the American Academy of Pedontics. The committee was composed of Hugh Kopel, Morris Kelner, Ray Werther and Maury Massler, as Chairman. We suggest you read the material carefully, for you will find the answers to many questions presented to you by the parents of your child patients, all substantiated by a comprehensive bibliography. As a suggestion for Unit activity, the material might well serve as the basis of a panel discussion, to which would be invited orthodontists, pediatricians, child psychologists, teachers and parents.

It is our intention to publish in the next issue of our Journal, similar reports on various study projects of the Academy of interest to the dentist who includes children in his practice.

A.E.S.

ORAL HABITS

I. Classification
- A) Pressure Habits
  1. Thumbsucking (finger sucking, blanket sucking, toy sucking, etc.).
  2. Lip Habits (lipsucking, lip biting, "mentalis habit," etc.).
  3. Tongue Habits (tongue thrusting, tongue sucking, cheek sucking, abnormal swallowing habits, etc.).
  4. Postural Habits (leaning habits, chin resting, pillowing, or sleeping habits, etc.).
- B) Mouthbreathing (open-mouth habit.)
- C) Biting Habits (fingernail biting, pencil biting, lip biting, gum chewing, etc.).

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2. Klein, E. T.: Amer. J. Orthod. **38:** 569, Aug. 1952.
3. Hogeboom, F. E.: Practical Pedodontia, C. V. Mosby Co. VI ed., 1953.
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1. Thumbsucking

Diagnostic Points and Effects

1. The significance of thumbsucking and its effects on the dentition differs with age, state of eruption of teeth and most important, with *the intensity and duration* of the action.

2. If performed at an early age (3 mos. to 1 yr.) at low intensity and short duration, the act is considered to be normal and the effects on the dentition are nil. Thousands of "average" infants suck their thumbs, without ill effects. If performed at later ages (4–6 years) at high intensity and prolonged duration, the action is probably symptomatic of a regression to an infantile level and the effects on the dentition may be severe. When performed during the eruption of the permanent incisors the effects are almost always very severe.

3. The primary effect of thumbsucking is to push the upper incisors labially. If concomitant pressure is made by the thumb on the lower teeth, these are inclined lingually. The result is an overjet and a distinct anterior open bite. The open bite frequently leads to tongue thrusting habits and lisping.

Reports indicate that fingersucking may lead to contraction of the maxillary arch. This has not been substantiated by actual statistical review of patients.

Some reports indicate that thumbsucking may lead to a distal displacement of the mandible. This has been shown to be incorrect by a statistical review of thumbsuckers vs. non-thumbsuckers with and without Class II malocclusions (Sillman).

Decision Regarding Treatment

1. Pediatricians, psychiatrists and pedodontists now generally agree that thumbsucking is a normal action during the first 2 years of life and should not be interfered with *unless excessive damage to the occlusion* is evident and then only after proper pediatric consultation.

2. From 2 to 5 years of age, occasional thumbsucking at certain times (falling asleep, after punishment, etc.) is still regarded as normal. These actions do not (generally) produce any damage to the occlusion. If the intensity and duration of the action is excessive (habitual) it may cause damage to the occlusion.

Several investigators (Bakwin and Ribble, Levy, Bolton, Levine) suggest the use of a rubber nipple pacifier at an early age to prevent the use of the thumb or fingers by the child to satisfy its sucking needs. Thumbsucking is much less prevalent in cultures where the use of a pacifier is practiced. It is claimed that the soft yielding rubber nipple does not produce pressure against the upper incisors as does the hard, unyielding finger. This method of preventing the ill effects of thumbsucking merits further investigation.

The decision as to treatment is highly individual and must be predicated upon a thorough analysis of the individual case. Sillman has shown that the malocclusion tends to correct itself if the thumbsucking is discontinued before the fifth year and if the labial and lingual musculature are in normal tone and balance.

3. After 6 years of age the action should be regarded as infantile and/or symptomatic. Since damage to the erupting incisors is almost inevitable, treatment is usually indicated.

Types of Treatment

1. Punitive methods are generally unsuccessful and tend to fix the habit rather than transfer it. Tied sleeves, bitter substances, ridicule and scolding are much less successful than sympathetic understanding and helping the child to mature.

2. A fixed palatal wire or crib (intraoral) seems to be the most effective appliance to displace the thumb. However, appliances will not succeed unless the child is ready to accept them.

3. When the child wants to discard the habit, a simple finger bandage or nail polish may act successfully as a reminder.

4. Education of the parents and their cooperation is essential to successful therapy.

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2. Sullivan, A. W.: N. Y. State J. of Med. **54:** 2474, Sept. 1954.
3. Massler, M. and Wood, A. W. S.: J. Dent. Childr. **16:** 1, 1st Quart., 1949.
4. Teuscher, G. W.: J. A. D. A. **27:** 1703, Nov. 1940.

2. Lip Habits

Diagnostic Points and Effects

1. Lip habits often are transfers from displaced thumbsucking habits.

2. Lip sucking or "biting" may lead to the same effects as thumbsucking.

3. The most destructive type of lip habit is the passive or active thrusting of the lip between the upper and lower incisors. The lower lip is turned inwards and grasped between the incisors placing pressure anteriorly behind the upper incisors. The latter are thus tipped labially.

The more forceful the action, the greater the effect.

4. The active lip thrust is generally termed a "mentalis habit" since the contracture of the mentalis muscle ("button chin") is typical and diagnostic.

5. The effects are most damaging if the "mentalis habit" is practiced during the active eruption of the permanent incisor teeth.

Decision Regarding Treatment

1. Damage to the occlusion is almost inevitable if this habit is practiced during the 6th to 12th year since even slight pressures are damaging during the eruption of the incisors. The greatest frequency of the habit appears to be between 6 to 12 years.

2. The decision as to treatment is probably best predicated upon the presence or absence of incisor protrusion. If no protrusion of the incisors exists, the habit is best ignored. If the incisors are protruded, it is best to correct the habit as early as possible.

3. Discountinuance of the habit usually occurs during adolescence when the child becomes self-conscious or is shamed by other children.

4. Self-correction of protruded incisors is common during adolescence by bringing the lower lip up and over the upper incisors.

Types of Treatment

1. Type of treatment varies with the age of the child. At all age levels, conscious and willing cooperation by the child is essential. Treatment at age 10 or older is not difficult since the child is usually conscious of the "buck teeth" and wishes to correct them.

2. In many instances, myofunctional therapy alone is effective. This consists of various lip exercises (paper held between the lips, trumpet playing, etc.) designed to take the lower lip from behind the upper incisors and replace it forcibly *over* the upper incisors. Self correction by pulling the lower lip forcibly *over* the upper incisors occurs frequently in self-conscious adolescent girls.

3. In severe cases, or in younger children who are ready to accept treatment, a labial arch (attached to molar bands or a palatal plate for anchorage) may be used to close the overjet and at the same time displace the lower lip from behind the upper incisors.

4. Sharp spurs attached to bands or to a palatal wire have been used to discourage the lip sucker. These punitive methods, although effective, are generally regarded with disfavor by the pedodontist, pediatrician and psychologist.

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1. Johnson, L. R.: J. A. D. A. **30:** 848, 1943; J.A.D.A. **26:** 1245, 1939; J. A. D. A. **24:** 1409, 1937.
2. Teuscher, G. W.: J. A. D. A. **27:** 1703, Nov. 1940.

3. Tongue Habits

Diagnostic Points and Effects

1. Lip and tongue habits are often classed together since the deformities produced are similar. However, incisor protrusion caused by a tongue thrusting habit is characterized by the normal position and tonus of the lower lip and absence of the contracted mentalis muscle, while incisor protrusion caused by a lip habit is accompanied by abnormal position of the lower lip plus a tense or contracted mentalis muscle causing a 'button chin."

2. Tongue thrusting is the most pernicious of the tongue habits since it produces the most severe effects. These consist of a labial protrusion of the upper permanent incisors with spacing, depression of the lower permanent incisors (not

invariably) and an anterior open bite accompanied by lisping.

3. The question as to which causes which is still equivocal: Does the tongue thrust cause the anterior open bite or does the anterior open bite result in the tongue thrust?

4. It is generally stated that abnormal swallowing habits result in a tongue thrusting habit. However, the etiology of abnormal swallowing habits is debatable. Large inflamed tonsils and "sore throat" have been cited as etiologic in abnormal swallowing habits and in abnormal tongue thrusting but this cause and effect relationship can be shown to exist in only a few cases.

5. A relation between tongue thrusting and "anesthetic throat" has also been suggested.

6. It is generally accepted that lisping is frequently associated with anterior open bite and tongue thrusting.

Decisions Regarding Treatment

Treatment should be predicated upon (a) the presence of an upper anterior protrusion and anterior open bite and (b) the actual (not implied) demonstration of an active, forcible thrusting of the tongue into this space.

Types of Treatment

1. Myofunctional exercises or conscious repetition of the correct method of swallowing are generally ineffective in the young child (under 6 years) since tongue movements, unlike lip movements, are much more difficult for the young child to control.

2. Conscious re-education is more successful in the adolescent especially if presented as a speech corrective exercise when a lisp is present. The child is generally cooperative and will succeed in controlling the tongue *if taught how to do so.*

3. The most effective method of *preventing* the tongue from thrusting itself between the incisors is to construct a vertical wire "basket" or "crib" attached to a lingual or palatal arch using bands on the molars for anchorage. A palatal plate may also be used for anchorage in older cooperative patients. This appliance catches the tongue and prevents its protrusion between the teeth. A labial arch can be added to the palatal plate to retrude protruded incisors if spacing is also present. When acceptable to the patient it quickly helps the child to control his lingual movements. If not acceptable to the child the appliance is quickly "lost" or mutilated. Even a fixed appliance may have anchor teeth moved and the palatal arch imbedded in the soft tissues by forceful thrusts of the tongue in an angry child.

4. Infrequently, sharp spurs attached to the upper incisors have been used to discourage tongue thrusting. If used at all, they must be used with caution and understanding.

5. Cooperation by the parents, plus their sympathetic understanding of the problem is essential to successful therapy.

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2. Salzman, J. A.: Principles of Orthodontics, Lippincott, Philadelphia, 2nd ed., 1950, p. 446–456.

4. Postural Habits

Diagnostic Points and Effects

1. Pressure on the teeth resulting from postural habits during rest (leaning habits) or during sleep (pillowing habits) may cause deformities of the arches and the jaws as witnessed by individual cases in whom the cause and effects are clearly demonstrable.

2. In order for pressure habits of this

nature to influence jaw growth or cause collapse of the buccal segments of the arch, the force must be excessive in amount and very long in duration.

3. Postural changes during rest or sleep are so frequent that deleterious effects occur in only a small number of exceptional cases.

4. When the force is of sufficient intensity and duration to cause deformity, the effect is usually on the buccal segment of the maxilla rather than the mandible since the latter is mobile and gives way under pressure. The effect is invariably unilateral.

Decision Regarding Treatment

1. When deformity exists, treatment should be instituted at once.

2. Prevention per se is not feasible in view of the questionable incidence of deformities.

Types of Treatment

1. Discontinuance of the pressure habit must be achieved before any appliance may be used lest the appliance be ineffectual. Resting and leaning habits can be readily corrected by the cooperative child since, in general, these deformities are seen during the grade school age. Pillowing or sleeping habits usually occur in younger pre-school children and can be corrected by the intelligent cooperation of the parents. They can study the sleeping habits of the child and invent measures to correct them if the pedodontist assists them.

2. The final correction may be accomplished by orthodontic appliances.

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2. Strang, R. H., Textbook of Orthodontics, Lea and Febiger, Philadelphia, 3rd ed., 1950, p. 136.
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Mouthbreathing

Diagnostic Points

1. Mouthbreathing is very prevalent in children between 5 and 15 years of age. It is estimated that 85% suffer from some degree of nasal obstruction while 20% are habitual mouthbreathers.

2. Mouthbreathing may be obstructive or habitual; total or partial; continuous or intermittent. The type and character determines the mode of treatment. Diagnosis is simple and should be made by the pedodontist in consultation with the rhinologist. Detailed diagnostic procedures have been described by Massler and Zwemer (1953).

3. The direct cause of mouthbreathing is some form of obstruction in the nasopharyngeal airway (chronic engorgement of the middle turbinates due to airborne irritants and/or allergy; marked deviation of the nasal septum; pharyngeal tonsil hypertrophy, physiologic or inflammatory). Allergic rhinitis is the prevalent cause in industrialized areas.

4. The most important predisposing factor is a narrow airway which is easily blocked by even minor obstructions. The combination of a narrow pharyngeal airway plus physiologic hypertrophy of the tonsils and/or allergic rhinitis give rise to the so-called "adenoid facies."

5. Removal of the obstruction (i.e. adenoidectomy) does not insure return to nasal breathing. Most children continue to mouth breathe until adolescence (habitual mouthbreathing).

6. Testing for nasal and pharyngeal obstruction is easily done by holding a wisp of cotton over each nostril. Snoring during sleep is indicative of obstruction.

7. Obstructive mouthbreathing should be treated by the rhinologist. Habitual mouthbreathing should be treated by the pedodontist.

8. The open-mouth habit (flaccid, hypotonic oral sphincter) is frequently seen in pre-school and early grade school children. This is not related to mouthbreathing since these children breathe normally through the nose. The open-mouth habit is normal during deep sleep and in infants. If it persists during the day in older children, Ballard believes it to be due to immaturity of the orbicular oris sphincter musculature. Like mouthbreathing, it is usually self-corrected by the self-conscious adolescent. The effects of the open-mouth habit are identical with mouthbreathing.

Effects of Mouthbreathing (and Open-Mouth Habit)

1. Dropping the lower incisors from behind the upper incisors permits the tongue to rest against the upper incisors. The lower lip drops from the upper incisors thus removing its constrictor action from the upper incisors. The upper lip being flaccid and hypotonic is unable to oppose the pressure from the tongue. The result is that the upper incisors are pushed labially.

2. As the upper incisors are protruded labially, the upper lip is pushed upwards exposing the upper incisors and giving the lip the appearance of being too short. In most instances the lip is of normal length but hypotonic. If the upper lip is truly short, the effects are severe.

3. The lower lip finds a convenient position behind the upper incisors, thus perpetuating and accentuating the protrusion.

4. Since the posterior segments of the arch are not in occlusion, the buccal musculature rests unopposed upon the maxillary arch, causing it to contract. This furthers the anterior protrusion of the upper incisors.

5. The passage of air through the mouth causes a mild xerostomia, accumulation of débris (bacterial?) and a hypertrophic marginal and papillary gingivitis in the anterior segments.

6. Mouthbreathing results in a failure to properly cleanse and humidify the air before it is received by the lungs. Many dire effects have been ascribed to mouthbreathing. These range from anoxemia and pigeon breast to respiratory allergies. These effects are not supported by objective clinical data. In significant numbers of cases however, correction of mouthbreathing has reduced bronchial irritations and respiratory allergies.

7. The oral, dental and respiratory effects appear to be much more severe in the ectomorphic child with narrow facies than in the endomorphic child with broad facies.

Decision Regarding Treatment

Rhinologists and pediatricians are agreed that mouthbreathing is unphysiologic and therefore undesirable, especially in city dwellers breathing grossly polluted air. All are agreed that mouthbreathing should be corrected whether or not deleterious effects are demonstrable and at as early an age as possible.

Types of Treatment

1. Treatment of *obstructive* mouthbreathing lies in the domain of the rhinologist. Surgical removal of obstructive tonsils is fairly simple but the treatment of chronic hypertrophic rhinitis (allergic or otherwise) may be prolonged and complicated.

2. Habitual mouthbreathing should be corrected by the trained pedodontist. Most investigators who have dealt with this problem directly agree that the Oral Screen is the most effective device to correct habitual mouthbreathing. This is a piece of material (usually plastic) fitted inside the anterior vestibule. A patent

naso-pharyngeal airway must be insured before it is used. All patients should be checked by the rhinologist for obstruction before the Oral Screen is used.

3. Myofunctional therapy is also effective either alone or supplementary to the Oral Screen (lip exercises, breathing exercises, horn or flute playing).

4. Punitive devices such as taping the mouth at night are no longer regarded with favor—although usually effective in restoring nasal breathing.

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Biting Habits

1. Biting habits are as characteristic of the later childhood period as sucking habits are characteristic of the infant.

2. Biting habits have their inception at about 4 to 5 years of age, the most common being fingernail biting. These habits persist throughout life in the original form or as transfers to other more socially acceptable forms (pencil biting, toothpick chewing, lip biting, gum chewing, etc).

3. In general, biting habits are not destructive to the occlusion unless practiced in a perverted or unduly stressful manner. This is due to the fact that, unlike sucking habits which exert pressure *against* the long axis of the tooth, biting habits produce pressures *along* the long axis of the tooth. Unduly forceful biting habits (as in pencil chewing) may injure the periodontium. Perverted chewing habits (constant use of a pencil or pipe as a lever against the teeth) may cause movement of one or two teeth.

Fingernail Biting

Diagnostic Points and Effects

1. Almost every child bites his nails to some degree at some time during his life. It usually begins at 4–5 years of age and reaches its greatest intensity at puberty. During adolescence nailbiting is usually displaced or transferred by other biting habits because of social pressure. This occurs much earlier in girls than in boys. Nailbiting is rarely seen after age 30 years because of its social stigma.

2. Nailbiting is a tension-releasing mechanism and is probably a direct transfer from thumbsucking. As a tension-releasing mechanism it has the same significance as gum chewing or cigarette smoking which are used as tension-releasing mechanisms at later age periods.

3. Excessive and compulsive nailbiting is symptomatic of excessive inner tensions.

4. Epidemiologic studies show that normal and even compulsive nailbiting have no effect on the dentition in spite of frequent statements to the contrary. It is possible that injury may occur in exceptional cases when the act is stressful.

5. Nailbiting is easily diagnosed and its intensity rated by examination of the fingernails.

Decision Regarding Treatment

Treatment of fingernail biting is not indicated nor desirable. If injury to the dentition is discovered in the exceptional case, underlying cause should be removed rather than the nailbiting since the latter is only a symptomatic expression of inner tensions.

Types of Treatment

Punitive measures such as application of bitter substances, restraints, scolding,

nagging and threats are condemned by the psychologist and pediatrician. They are not only ineffective but often serve to fix the habit more firmly than before.

If, for social reasons, it is felt that fingernail biting should be discontinued, then a sympathetic approach and encouragement are all the mature child requires to transfer the habit to a less odious type.

Perhaps the most important aspect of this problem is the education of the parent to accept fingernail biting as a normal action during childhood which serves as a tension-releasing mechanism and which is *not* harmful to the child or society.

Perhaps the second most important aspect of this problem is to educate the dentist to a similar understanding!

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THE LABIAL FRENUM

I. NORMAL POSITION DURING THE PRIMARY AND MIXED DENTITIONAL PERIOD

The frenum labii superioris contains a dense band of fibrous connective tissue. Its attachment extends to the crest of the alveolar ridge before the primary incisors erupt. As the primary central incisors erupt and the alveolar process increases in height, the frenum attachment is normally left behind. This sometimes leads to the illusion that the frenum attachment has actually receded.

The process is repeated during the eruption of the permanent incisors. The attachment is high and may extend to the alveolar crest when the permanent centrals are newly erupted. Normally, as the centrals erupt and the alveolar process increases in height, the attachment is left behind at a lower apical level.

II. EFFECT ON ALIGNMENT OF THE PERMANENT INCISOR TEETH

The normal frenum is thin and does not extend over the alveolar crest. In some instances, the frenum may be coarse and wide and extend over the alveolar crest to the palatal papilla and even into the suture between the two maxillae (Moyers). In such cases, the frenum may prevent normal growth of the alveolar process between the incisors and prevent proper alignment and approximation of these teeth. A permanent central diastema then results. In such cases, the frenum is termed "abnormal."

The exact diagnosis as to whether a central diastema is normal, physiologic and transitory or whether it is abnormal and permanent and due to the presence of an "abnormal" labial frenum must be made with caution. Spacing of the permanent central incisors plus divergent

axial inclination is the normal pattern of incisor alignment during their eruption from 6 to approximately 10 years of age. The erupting lateral incisors and finally the cuspid teeth butt against the mesial tooth and serve to correct the axial inclination of the permanent incisors and to close the diastema. If an abnormally dense labial frenum is attached between the central incisors and extends over the alveolar ridge, it may prevent correct alignment of the incisors and closure of the central diastema.

Since the distinction between a "normal" and an "abnormal" frenum is often difficult most investigators prefer to reserve judgment until the cuspids are erupted at approximately 11–12 years of age.

A permanent central diastema may also result from congenital absence of the lateral incisors, or even from peg shaped laterals.

III. Surgical Treatment

1. Thousands of children have been subjected to unnecessary and cruel labial frenectomies at the ages of 7 to 10 years because the physiologic spacing of the permanent incisors normal to that age period was mistaken for spacing due to an "abnormal labial frenum." Actually, the abnormal labial frenum is a relatively rare occurrence.

There is some evidence that surgical scarring of the normal frenum has actually caused the spacing between the centrals instead of preventing it.

There is little indication for surgical removal of the labial frenum except in unusual instances where the diagnosis is unequivocal. The conservative view is to wait for the central diastema to close itself during the eruption of the cuspids.

2. Surgical procedures vary greatly from simple incision to deep cautery to the alveolar crest. Objective studies as to the superiority of one procedure over the other are lacking.

IV. Orthodontic Appliances

Space closure may be accomplished by early surgical removal of the abnormal labial frenum or by orthodontic means. The best procedure is a combination of both. Surgical excision alone may not produce the desired result because of the formation of scar tissue.

1a. Bracket bands are placed on each central incisor, connected with a short arch wire and activated with (a) ligatures (b) springs or (c) curving the ends of the arch to act as springs.

1b. A palatal plate with finger springs to force the incisors together is also effective and rapid.

2. When the tissue between the central incisors begins to pile up and offer resistance to further closure, a simple nick or surgical channel will remove the obstruction and permit complete closure. This method is simpler and less traumatic than extensive surgical dissection of the attachment. Even when the labial frenum is normal and spacing was due to other factors, nicking the tissue between the incisors facilitates final closure and reduces the period of retention presumably because of the resulting scar contracture.

V. Optimal Time for Treatment

Opinions as to the optimal time to close a central diastema which appears to be permanent vary greatly from 7 years of age, during eruption of the centrals, to 12 years of age, after eruption of the cuspids.

If an abnormal labial frenum is unmistakably evident, orthodontic closure followed by surgical excision should be attempted as early as possible.

If the frenum appears to be reasonably

normal and the lateral incisors are present and normal, yet permanent spacing also seems inevitable, it is probably better to delay judgment until after the cuspids erupt. A central diastema is frequently a racial or familial characteristic. Simple orthodontic correction (plus "nicking" the interproximal "piled-up" tissue) is usually effective between the ages of 11 to 15 years.

A truly abnormal frenum seems to become more pronounced with age while a simple frenum becomes less evident as the child grows older.

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A Classification and Treatment for Traumatized Anterior Teeth

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IN DENTISTRY for children the treatment of injuries to anterior teeth is of increasing concern to the dentist. This problem has so many facets that we cannot simply institute treatment, but our treatment plan must consist of proper operative procedures, based on present day knowledge, with emphasis on the esthetic appearance, and the psychological treatment of the child and parent.

This injury problem can be directly attributed to the hazards of our vigorous way of life, coupled with the prominence of anterior teeth, and the value we place on favorable appearance.

The esthetic factor is of paramount importance. Recently in the literature much has been written of how faulty dental appearance can lead to psychological problems. A disfiguring dental anomaly may lead a child to an inferiority complex or a super-sensitivity. Many men and women, who might have been successful, may have failed in life because their facial appearance was unfavorable, and they developed psychological patterns which prevented them from leading a successful life. The dentist, when approaching the problem of fractured anterior teeth, must do so with a sense of great responsibility, for if he fails the entire future of the young individual may be affected.

Protrusion is the most important factor in injury to these teeth. It is caused by habits such as thumb and finger sucking, improper care of the primary dentition, and hereditary factors. Recent surveys show that the prevalence of fractured teeth among school children, regardless of economic condition, was greater than five per-cent. Over seventy-five per-cent occur in the maxilla, and twenty-five per-cent in the mandible. Observers have noted that eighty to ninety per-cent of all fractured anterior teeth protrude and do not have proper lip coverage. It would follow therefore that in our dual role of diagnostician and dental operator it becomes our duty to instruct parents, dentists, and physicians in the value of maintaining the dental arch in its proper alignment. Protruding teeth, when noted in the examination, should be classified as to prevent the traumatic loss of tooth structure.

The causes of injury are many, but to list a few: falling; thrown objects; schoolground, bicycle and automobile accidents; and participation in sporting events.

In understanding treatment we must have some common basis for discussion. Brauer, McBride, Ellis, etc. have all classified types of fractures, but there is no unanimity of opinion. I propose the following as a basis for standardization, and while it may never be universally accepted, I offer it as a simplified method of classifying fractures.

Class I—a simple fracture of the crown, exposing no dentin.

Class II—fracture of the crown, involving little dentin.

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Class III—An extensive fracture of the crown, involving considerable dentin, and not exposing the pulp.

Class IV—extensive fracture of the crown, exposing the pulp.

Class V—complete fracture of the crown, at or below the gingival margin.

Class VI—fracture of the root, with or without loss of crown structure.

Class VII—vertical or horizontal displacement of the tooth.

Class VIII—tooth loss as a result of trauma.

This classification is for the permanent teeth. In classifying injuries to the primary dentition, the same classification would be used, only with the letter P following the class. For example: a primary central with an extensive fracture of the crown involving considerable dentin, and not exposing the pulp, would be a Class III P classification.

When a child presents at your office, certain examination requirements must be ascertained prior to treatment. A brief but inclusive history should be recorded for each case. This history should include name, address, etc. age; when, where and how accident occurred; history of previous accidents to these teeth; and patient's own findings as to pain, soreness to light percussion and thermal changes.

Your visual or clinical findings should include classification of injury, tissue damage, mobility, occlusion tests, and percussion and thermal tests. Vitalometer tests at this point are not indicated, because the great majority of teeth, after an accident, have no reaction. After several weeks, if they are going to return to normal, they slowly begin to respond and they should be compared with adjacent teeth for determining pulp vitality. Radiographic findings from several different angles are a necessity in every case. This evidence helps us to determine root development, and/or fracture, size and relation of pulp to fracture; and these records are invaluable for future consultation and comparison.

Now for a discussion of methods of treatment for the above mentioned classes of fracture.

Class I—(simple fracture of the crown, exposing no dentin)

Record history as described above. Treatment consists of disking the sharp enamel edges and polishing until smooth. Then apply a coat of protective varnish. Patient should keep you advised as to symptoms, if any, and should be recalled in eight weeks to check vitality with adjacent teeth, and retake and compare roentgenograms. These cases usually need no further treatment.

Class II—(fracture of the crown involving little dentin)

Record history, as described above. Wash tooth with warm water, isolate with cotton rolls, and dry. Place a mixture of zinc oxide and eugenol over the exposed dentin. Over the sedative dressing place a thin mix of cement, paying particular attention that none of the cement comes in contact with the dentin. After the cement has hardened, keeping the tooth still isolated, cement on either a celluloid crown or a stainless steel band. Prior to final cementation, check the occlusion and correct if necessary. This protective treatment must be maintained for a minimum of eight weeks, and at that time determine if the pulp is responding to treatment. After treatment inform the parent that everything has been done to save the vitality of the tooth, but that despite what you have done, the pulp may die due to the trauma the tooth received. Most of these teeth, if seen soon after fracture, respond to treatment, but

if they become non-vital, a pulpectomy must be done. When the tooth has responded to treatment, and there is pulpal recovery, then a "temporary-permanent" restoration can be placed.

In some instances, where the fracture exposed a slight amount of dentin, no further protection is required other than cavity varnish on the dentin, and a small amount of incisal grinding to bring the tooth into incisal harmony. Where the fracture is more extensive, a temporary acrylic jacket should be prepared. Prepare the jacket under water spray, cutting a minimum of dentin, and establishing a slight finishing line below the free gingiva.

Another treatment finding great popularity is the modified three quarter crown, with an acrylic veneer, restoring the missing portion of the tooth. Be sure to have as little gold as possible showing in the restoration. When pulpal recession has taken place, then the permanent restoration may be placed. This is anywhere from fifteen years of age on. The porcelain jacket crown is the restoration of choice.

Class III—(Extensive fracture of the crown, involving considerable dentin and in close proximity to the pulp)

Record history as described above. Wash tooth with warm water, isolate with cotton rolls and dry. Place a mixture of calcium hydroxide and water over the exposed dentin. Over this therapeutic dressing, place a coating of cavity varnish and then a thin mix of cement, again paying particular attention that none of the cement comes in contact with the exposed dentin. After the cement has hardened, still keeping the tooth isolated, cement on either a celluloid crown or a stainless steel band. Be sure the tooth is out of occlusion.

The protective treatment is left for a minimum of eight weeks, preferably twelve or more weeks, and at that time determine whether or not the tooth is responding to treatment. This is done by comparing roentgenograms, vitalometer tests, and percussion and thermal tests. If the tooth has responded favorably to treatment, the same type of temporary-permanent treatment is done as on the Class II fractures.

The importance of the temporary-permanent restoration is vast. The child is passing through a very formidable period in mental and social development. Any unfavorable psychological-dental problems at this age can be retained, and mold the child's future accordingly.

As mentioned before, we have told the parent that in spite of our treatment, the pulp may die as a result of the trauma. Also neglected cases are often seen, where the parent did not bring the child to a dentist until there was no, or only partial, vitality left in the pulp. If the pulp fails to recover normally in the Class I, II, and III category, then pulp extirpation and root canal filling is indicated. In pulp extirpation the tooth must be useful functionally and esthetically, and the patient healthy. Previously in the literature it has been stated that root development must be complete or nearly complete. With present day methods the management of the wide open apex can be quite successful.

Class IV—(an extensive fracture of the crown, exposing the pulp)

Unfortunately, a large majority of the cases presenting themselves to your office will be of this classification. Many dentists are tempted to perform a pulp capping, and failures will range anywhere from thirty to fifty per cent (30% to 50%). With such a large percentage of failures it would not seem wise to perform

a treatment the success of which is so limited. The treatment of choice should be a vital pulpotomy.

Record history as described above. Place a suitable topical ointment in the muco-buccal fold, and *wait one minute.* Then give a local anesthetic. Isolate the tooth with a rubber dam and wash the area with seventy per cent alcohol. Open up from the lingual surface into the pulp chamber, and remove the bulbous portion of the pulp with a sharp spoon excavator. Control hemorrhage with cotton pellets saturated with your local anesthetic solution. Place a creamy mix of calcium hydroxide and sterile water over the pulp stump. This layer should be one millimeter thick. Over the calcium hydroxide place either a layer of cavity varnish or a thin layer of zinc oxide and eugenol, or a thin layer of wax. Seal up the tooth with cement. At this time you may either fit a celluloid crown or, if the tissues have been bruised, place a layer of cavity varnish over the exposed dentin.

The patient is seen for observation only during the next ten weeks. Roentgenograms are taken after ten to twelve weeks, and if the result is satisfactory so that a dentinal bridge can be observed in the roentgenograms, then the patient is ready for a temporary acrylic jacket or a three-quarter crown with an acrylic veneer, as described previously. The permanent restoration is the porcelain jacket. This is placed from the fifteenth to twentieth year, depending upon the child's physiological age.

Class V—(complete fracture of the crown, at or below the gingival margin)

Record history as described above and after x-Rays are developed, diagnosis the case. Where the fracture is such that a gingival margin can be maintained, a vital pulpotomy as described above is indicated. Particular care should be taken to remove the pulp four to five millimeters below the fracture, so that a dowel may be placed in the canal for retention of the acrylic jacket.

Where an aseptic condition cannot be maintained at the first appointment, root canal therapy is indicated. The treatment is described above.

Only on those cases where the fracture is so far below the gingiva and where the tissue is so traumatized, is extraction indicated. After the tooth is extracted, and tissues allowed to heal, a space maintainer is made for the child, replacing the tooth. The permanent restoration is performed when the child is old enough to have a fixed anterior bridge.

Class VI—(fracture of the root with or without loss of crown structure)

Record history as described above. After the roentgenograms are ready, determine where the fracture line is. Where the fracture line is in the middle or apical third of the root, the prognosis is excellent. Where the fracture is close to the gingival margin the prognosis is unfavorable. For the case to be successful, the fragments must be close together, not in the cervical third of the root, and no infection must be present. If the case so indicates, immobilize the tooth, either by a splint, or wiring the teeth together. In forming the splint, band the teeth on both sides of the fractured tooth and connect these two bands with a wire running labially and one lingually to the tooth to be protected. A cast splint can also be constructed.

Healing takes place in these cases by a fibrous connection between the fragments, and regeneration of the paradontal tissues accompanies the disposition of the cementum. Esthetically these teeth do not have to be restored.

Class VII—(vertical or horizontal displacement of the tooth)

Record history as described above. Most of these cases occur in the primary dentition. The types of displacement will be extrusion, intrusion, or complete displacement. In the cases of extrusion, reduce the displacement as much as possible. Sometimes the use of local anesthesia is indicated. Immobilize the tooth for six months, having the patient favor the tooth in chewing and mastication. The incisal edge of the tooth may eventually have to be ground to conform with its opposite member. Periodic examinations are advised, as you and the parent should recognize the fact of possible pulpal necrosis. In some instances root canal therapy will be indicated. In some cases the odontoblasts are stimulated so that there will be complete calcification of the pulp tissue. On extrusion cases prognosis is usually favorable.

When intrusion has taken place wash the mouth out with warm saline solution, and prescribe warm mouth washes. Reeruption usually occurs. Again the parent must be told of a possibility of pulp necrosis or pulp calcification. These cases must be watched periodically. Treatment is the same as that for extrusion.

In complete displacement, if the patient has the tooth, and the displacement has occurred within four to six hours, replantation may be performed. The pulp is extirpated and the root canal is filled. The tooth is washed with warm saline solution, sterilized with untinctured metaphen, and thoroughly rinsed with sterile saline solution. The blood clot in the socket is removed under local anesthesia and a sterile #4 round bur is run from the labial surface, through the labial plate of bone opposite the apex of the tooth. This is done to insure proper seating of the tooth, as the fluids will escape through this hole. The tooth is then stabilized in the arch, and the parents are informed that the prognosis is unpredictable. Some cases are very successful, and in others resorption occurs. The taking of roentgenograms three times a year is indicated for all displaced teeth.

Class VIII—(tooth loss as a result of trauma)

When a child is presented to your office with a tooth missing, record history as described above; and after you see the roentgenograms wash the area with warm saline solution and reposition the alveolar process as best you can. Prescribe warm saline mouth rinses.

In the maxilla the tooth should always be replaced by a space maintainer, for esthetics, which are so important, and for phonetics. The only exception would be when a primary tooth is lost due to trauma, and the permanent tooth is about to erupt.

In the mandible a space maintainer may be placed; or, if the child shows very little of the lower anterior teeth in talking or smiling, either an orthodontic arch, or stainless steel bands, with a wire soldered to the bands may be used. The space maintainer is reconstructed at suitable intervals to compensate for the eruption of new teeth, and growth and development. When the child reaches the proper physiological age an esthetically perfect fixed anterior bridge is constructed.

It is every dentist's obligation to treat fractures of the primary and permanent dentition. Early treatment, in many instances, will prevent undesirable esthetics and possible psychological insecurity in the child.

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NOTICE

In compliance with Section 4, Article IV of the By-Laws of the Constitution of the American Society of Dentistry for Children, President Hunnicutt has requested publication of the following appointments:

Nominating Committee, 1955

ALFRED E. SEYLER
GEORGE W. TEUSCHER
HUGH KEENAN, *Chairman*

Auditing Committee, 1955

WENDELL WHETSTONE, *Chairman*
GEORGE HIGUE
ED PEASLEE

Unit News

Michigan

The Michigan Society of Dentistry for Children announces its program for 1955–56.

Philosophy of Diagnosis for the General Practitioner

October 5, 1955. Meeting in Ann Arbor, Michigan

a. Case History
b. L.B.A. Count and Dietary Analysis
c. Clinical Picture

December 7, 1955. Meeting in Detroit, Michigan

a. Radiographic Findings and Anomalies
b. Study Models of Occlusion
c. Orthodontic Evaluation from Above Data

February 1, 1956. Meeting in Detroit, Michigan

Multiple Table Clinics of Operative Procedures from Preceding Diagnostic Evaluations

March 7, 1956. Meeting in Ann Arbor, Michigan

Practice Management Presentation

Moderator, Dr. Alfred Seyler (Inviting the senior classes from the University of Detroit and the University of Michigan)

April 19, 1956. Meeting in Detroit, Michigan

Annual State Meeting & M.S.D.C. Luncheon

Ivory Room, Statler Hotel

Speaker to be announced.

Since the child population is more than ever on the increase and the parents are becoming more aware of the child's dental needs the general practitioner needs a practical, systematic approach to the problem of the child's dental health care. The coming year's program has been planned to help him achieve such a solution. By such a program, furthermore, the Michigan Society of Dentistry for Children hopes to stimulate interest in dentistry for children, as well as increase its own membership.

The Michigan Unit has an $8.00 annual dues to provide membership in the American Society of Dentistry for Children, membership in the Michigan Unit of this group, and to bring four issues of the Journal of Dentistry for Children. Those unable to attend meetings may have an associate membership entitling them to the valuable and interesting Journal of Dentistry for Children. Applications and requests for membership and information about the Society may be directed to: Dr. Hugh M. Kopel, President; 19933 Livernois, Detroit, Mich.

Does Functional Effort Affect Caries Activity?

H. H. Neumann, M.D. and N. A. DiSalvo, D.D.S., Ph.D.*

WE REPORTED, in the past, experimental efforts[1] designed to increase masticatory exertion in children. These attempts were based on previously described observations on large ethnical groups where we found closely associated a low caries rate with considerable vigor in the customary use of the teeth; in comparing the eating habits of many human societies this particular dietary quality—the physical texture—appeared in a consistent correlation to caries resistance. (Wallace[2], Klatsky[3], Philippas[4], Neumann[5]).

Our first controlled effort to induce harder chewing was conducted with sugar-cane in a group of twelve to fourteen year old children[1]. While beneficial effects on the rate of appearance of new cavities were obtained, the experimental handicaps were discouraging: they consisted in the poor dental quality of the children at that age, that is of a high caries incidence initially, interfering with proper chewing, and furthermore in the ease of evading the objective of vigorous chewing, unless the chewing activities were strictly supervised. Although sugar cane is highly fibrous in texture and lends itself to induce hard function, it can as well be used for sucking in the fashion of lollipops, thereby defeating entirely the proposed purpose. This custom is nowadays commonly found in the Caribbean and the Hawaiian Islands.

A logical next step in the experimental procedure consisted in the search for a material of both sufficient physical texture and appeal to children. We also considered that in any project to be carried on in areas of high caries prevalence much younger children would have to be observed and exposed to harder chewing, partly because their habits may not have been finally established and partly because of a less advanced state of destruction of their dentitions.

Clinical experiments reported by Volker[6] described the effects of prolonged chewing of gum in groups of children, with neither favorable nor unfavorable results regarding caries incidence. These experiments were carried out with commercial gum of the soft type, a consistency we regarded inadequate for our purpose.

Experimental Procedure

Although we believe hard crusted old time European peasant bread to be a suitable material offering adequate masticatory stress, we doubted its appeal to American youngsters, entirely accustomed to effortless ingestion of food. In the search for a compromise in the material to be selected we chose a specially prepared substance consisting of a resin base, requiring considerable effort in chewing, yet being reminiscent enough of the harder types of chewing gum to be attractive to children.

227 children at ages from three to five were examined in randomly selected nursery schools in New York City. Clinical oral examinations were carried out at the beginning and at the end of the nursery school year for two consecutive years. The advantage of selecting this early age group for a caries study lies firstly in the relatively small number of

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TABLE 1

Age in Months	Children in Groups		dmf Average	
	Experimental	Controls	Experimental	Controls
36–47	93	84	1.6	1.7
48–59	80	80	2.1	2.9
60–71	54	90	2.8	4.1
Total.....	227	254		

caries found at the onset of the experiment, and secondly in a generally high caries susceptibility, that is, in a great liability to changes in the caries picture within two years, thereby providing a more suitable index to caries activity than older age groups. The chewing material was distributed every schoolday at various times in the different nurseries and hardly any child refused to chew. The resin lumps remain hard for several minutes and maintain, for a much longer time, a fairly consistent tough-elastic texture; they may be chewed for half an hour and longer. As controls we used other nursery school children in the same age groups, selected again at random. In the evaluation of the findings we employed the estimation of the dmf rate. The results are summarized in the table 1.

Results

The rate of the appearance of new cavities was markedly lower in the hard chewing children. The results were not as drastic as those described by Lilienthal and co-workers[8] and by Cioffani[9] who were both able to all but eliminate caries in the same age group, by emphasizing coarseness of the diet and simultaneously cutting down on the intake of refined carbohydrates. In the present project we attempted to limit the variables solely to the moment of function.

The following experimental difficulties may have interfered with a proper evaluation of the preventive potentialities of hard chewing: firstly the gum was distributed only once a day, on school days and not during vacations and week-ends, which curtailed the amount of chewing below a point originally considered desirable; secondly, some of the children had poor dentitions and many cavities even at the age of three when the experiments began; thirdly, because of the large turnover of children in the nurseries it was not possible to maintain the full number of children that initially seemed desirable for statistical calculations.

Discussion

The findings favor a continuation of efforts to supply children with hard materials to chew and even though the chewing qualities of the resin lumps were good it should be possible to improve not only on the amount of time spent chewing but possibly also on the texture of the substance supplied. The gum base used in the present project was generally well accepted by the children. Its low sugar content presents a very small percentage of the ordinary sugar intake by children and is barely sufficient to make it initially palatable. After brief chewing it is largely removed from the material and what remains is the slightly flavored gum base. Its consistency exceeds considerably the hardest type of gum presently commercially available.

The mechanism of the effect of hard chewing on caries reduction is in our opinion attributable to its impact on the enamel structure and not to a superficial detergent action.

J. H. Shaw[7] obtained in desalivated rats striking reductions in dental caries incidence, by adding to their diet chicle, polyvinyl acetate or arochem, inert materials of widely differing chemical composition. Shaw leaves the modus of its

effect unanswered and considers a surface cleaning action as a possibility. We are unsure whether the experiences gathered from desalivated rodents are applicable to children.

The suggestion that a structural or metabolic effect of vigorous mastication on the enamel rather than a cleansing action may influence its immunity to attacking agents in the mouth was prompted by our observation amongst primitives, that hard detergent food cleans adequately only the occlusal surfaces. The teeth of primitives are usually found to be covered by plaques, tartar and by soft debris in the interproximal spaces and on the smooth surfaces. Yet interproximal caries is as rare as caries on the occlusal surfaces. A sensitivity of the enamel to its degree of function, that is, the load of intermittent compression was indicated in examinations of the phosphorus turnover in the enamel of chewing and non-chewing teeth of the monkey; by using tagged phosphorus we found a considerable difference in the phosphorus exchange rate depending on the amount of functional stress[10].

In applied physics a number of investigations have been concerned with the effect of work on the surface of specimens, by exposing them to repeated loads. The consistently beneficial effect on the endurance limit of the surface material has been considered to be the result of crystal reorientations (Freudenthal, A. M.[11]). The textural stresses in the surface layers, from intermittent compression lead in crystal lattices to orientations very different from the original ones. We are inclined to see in "work hardening" under pulsating loads in the field of physics, and in maturation of teeth under adequate load, two related phenomena.

Whatever the dynamics of producing a higher caries resistance with increased function, we believe that evidence available is sufficient to add vigorous use of the masticatory apparatus to the tools of combatting caries susceptibility, though the commercially available food items for the purpose are at this time not quite satisfactory.

Summary

1. A hard resin base was supplied to children of nursery school age in order to induce them to daily vigorous mastication.

2. This base was slightly flavored and a small amount of sugar was added for initial taste appeal. The lumps seemed to be readily accepted by the children.

3. The caries rate was followed and compared with controls of the same age. In spite of the irregularities in the chewing due to absence on week-ends, holidays, vacations and with unsteady attendance of the children, the rate of caries was considerably lower in the hard chewing children.

4. We are inclined to attribute this difference to the compression under heavier loads on the structure of the tooth, increasing thereby enamel resistance to the attacking agents in the mouth.

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Prosthetic Dentistry for Children*

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Evolutionary Trend in Dentistry for Children

PROGRESS follows an evolutionary pattern from the simple to the complex, along which path mistakes are made, evaluated, and corrected. Each generation is given a greater opportunity because of the information gained by the efforts of the preceding generation. Herewith are discussed a few items.

The premature loss of a primary tooth has for too many years, been viewed as an event to provoke celebration, wherein the tooth was placed under the pillow and the good fairy rewarded the child with money. Even today this false sense of security is prevalent among the best families of our nation, and in some instances within the ranks of our profession. Accordingly, the dental profession must assume its share of responsibility for this attitude. Due to lack of skill in managing an uncooperative child, it is easy to visualize the dentist in past generations purposely promoting an attitude of lack of concern. The child and parents were led to believe such early loss of a primary tooth warranted little concern either in itself or in the consequences that follow. It was understood generally by the parents that when a primary molar aches, and has to be removed prematurely, another tooth will take its place shortly.

For many generations the extent of pedodontic service was limited to exodontics. Only a few years ago, a small number of brave souls in the profession decided to incorporate simple operative procedures to prevent or postpone exodontics, since a high percentage of extraction cases were observed to present severe orthodontic problems when the permanent cuspids and bicuspids attempted to erupt. Simple mechanical appliances which prevented severe drifting of the teeth, were introduced into dentistry and the profession labeled these space maintainers. These appliances have served a very useful purpose, not only in preventing orthodontic problems due to space closure, but also in impressing the patients and parents with the gravity of premature loss of primary teeth.

Until recently little concern has been shown by the profession in the loss of masticatory function. Now there is a strong trend toward functional appliances in the form of bridges and removable dentures. It is recognized that if the child is provided with a suitable functional prosthetic appliance, loss of space cannot occur. Accordingly, a replacement should be made for any primary tooth prematurely lost if there is any doubt regarding the early eruption of the underlying permanent tooth. This decision should be made mutually by the dentist and the parents of the child. A well planned and designed prosthetic appliance successfully worn at this early age has much to offer the patient, such as: (1) the retention of masticatory function; (2) the prevention of space closure; and, further, the patient is taught at an early age the value of complete dental service.

* Presented before Section on Dentistry for Children, Meeting American Dental Association, Miami, November 1954.

The Fixed Appliance

As a general rule, if a choice can be made between a fixed or a removable denture, it is the opinion of the author that a fixed appliance is preferable. However, the loss of more than one tooth in a given quadrant requires the use of a removable denture in that arch.

The First Primary Molar Bridge

Bridges replacing single posterior teeth all utilize the cantilever principle. To replace a first primary molar, a bridge abutment may be designed for the second primary molar in accordance with the extent of the carious lesions of this tooth. Retention cannot be overstressed in designing cantilever bridges. If caries exists only on the mesial surface of the second primary molar, a mesio-occlusal inlay preparation with a substantial buccal or lingual extension can give adequate retention. Mesio-occlusal-distal, three-quarter crown, or full crown preparations may be used in accordance with the extent of the carious lesions on the abutment tooth. The pontic on this type of bridge represents the occlusal surface of the first primary molar.

The Second Primary Molar Bridge

Second primary molars are replaced by bridges utilizing both the first pri-

FIG. 1. A cantilever bridge replacing a first primary molar. Note the pontic stands away from the tissues. The buccal extension to the mesio-occlusal inlay provides adequate retention.

FIG. 2. A model showing a cantilever bridge replacing a second primary molar. Both the cuspid and first primary molar are abutment teeth. This bridge is designed to permit the first permanent molar to erupt in its proper position.

FIG. 3. An x-ray of a bridge replacing lower second primary molar.

FIG. 4. An x-ray view of an upper bicuspid area, where both primary molars were lost prematurely, and no provision was made to maintain the space.

mary molar and cuspid as a double abutment. Retention on these teeth is provided by either full crown or three-quarter crown preparations. The pontic is a reproduction of the occlusal surface of a second primary molar. If the first permanent molar is erupted, the pontic will extend to the mesial surface of the first permanent molar. If the first permanent molar is unerupted, an extension is attached to the pontic extending into the tissues so that it rests just mesial to the mesial marginal ridge of the first permanent molar. This gives maximum assurance that the first permanent molar will not drift mesially during its eruption into occlusion. To facilitate removal of the portion of the bridge which extends into the tissues after the eruption of the first permanent molar, an acrylic rivet is used to attach this extended portion to the pontic. The acrylic can be easily removed by a bur when this union is to be broken.

The Removable Denture

If either or both second primary molars are removed in the same arch, and economics will not permit the construction of fixed bridgework, or if both primary

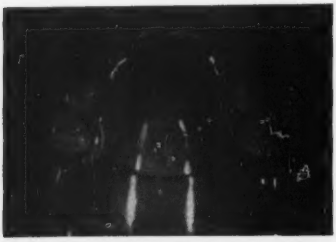

FIG. 5. A palatal view of a maxillary denture replacing both primary molars on left side, the first primary molar on right side, and both primary centrals.

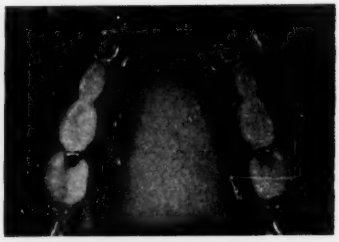

FIG. 6. A design of a mandibular denture using a cast lingual bar and clasps.

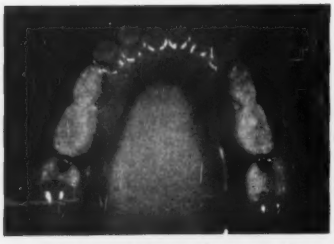

FIG. 7. A mandibular denture using an acrylic lingual bar and wrought wire clasps. This shows the ideal state of eruption of the first permanent molars when occlusal rests should be placed.

FIG. 8. A view of a mandibular denture replacing both primary molars. Note absence of buccal flange.

molars are missing in the same quadrant, then a removable denture is indicated. Children who have been conditioned properly for receiving a denture are excellent prosthetic patients. This can be accomplished best by first conditioning the parents. Unsuccessful results usually occur when one or both parents remain doubtful. In discussing the dental problem with the parent during the consultation period, when a denture is involved, it has been found very advisable to make a statement that if both parents are in favor of the treatment, then little concern need be shown whether or not the denture will be worn.

There are a few recommendations that might be made with regard to designing a denture. The upper denture generally is made of acrylic. Clasps supply very little retention against occlusal displacement. However, on a maxillary unilateral replacement, inserted prior to the eruption of the first permanent molar, a clasp may help prevent the rotation of the denture during the time the first permanent molar erupts. Occlusal rests on maxillary dentures seem to be unnecessary.

Mandibular dentures either can be made with an acrylic lingual bar fitted against the lingual gingival tissue, or a gold or stainless steel lingual bar can be

FIG. 9. An x-ray view of an ectopic eruption of an upper first permanent molar. This case requires treatment.

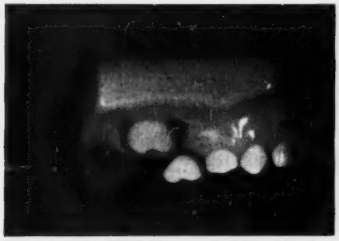

FIG. 10. A denture designed to guide first permanent molar into position. This type of denture was used to correct condition in Fig. 10. The denture was slightly raised from the tissue to show the shape of the artificial tooth.

FIG. 11. Photograph of the case shown in Fig. 10 after the eruption of first permanent molar.

FIG. 12. An x-ray view of an ectopic eruption of an upper first permanent molar. The first permanent molar erupted into normal position, but the root resportion on the second primary molar continued.

employed which does not contact the lingual tissue. Either cast or wrought wire clasps usually are used on mandibular dentures to provide all possible retention for at least the first few days of wear. Denture adhesive powder is indicated for the maxillary denture for the corresponding period. Occlusal rests on distal abutment teeth is essential. In a case where a denture replaces the second primary molars, prior to the eruption of the first permanent molar, rests should be placed on the denture as soon as the permanent molars have broken through the tissues to insure a proper line of occlusion. Parents should be warned that just prior to and during the eruption of these permanent molars, the child will experience some discomfort and may wish to leave the denture out of the mouth. This should not be allowed, since the condition is never unbearable, and without the denture (even for a few days) the erupting teeth may move forward considerably. Experience has taught that if a first primary molar is lost just prior to, or during, the eruption of the first permanent molar, the space may be lost rapidly if an appliance is not placed in the space.

Flanges on dentures replacing primary teeth are seldom necessary. The absence of flanges has presented no apparent problem to masticatory function, retention, or esthetics. In fact, esthetics usually is enhanced by the absence of flanges. It has been the experience of many practitioners when lifting a flanged denture from the tissue to see the outline of the flange pressed deeply into the underlying tissue. This experience and observation promotes question as to the condition of the buccal and labial bone in these areas.

Preformed teeth can be used successfully in the dentures for children. However, excellent results may be realized by preparing wax teeth on the wax denture and double packing, wherein the tooth color is used first and then the pink acrylic. These wax teeth can be made by pouring melted ivory colored wax into rubber molds that are designed to function as impressions for making stone models. These same wax teeth can be used for pontics of the posterior bridges which were discussed earlier.

Ectopic Eruption

Ectopic eruption of upper first permanent molars presents a common problem in every dental office. The cause and the physiological process related to this condition is debatable. A patient of five and one-half years of age may present with the disto-buccal root of the upper second primary molar absent, and the mesial marginal ridge of the first permanent molar just apical to the cemento-enamel junction of the second primary molar. The prognosis is unpredictable in most instances, since considerable favorable shifting may be evident in the first permanent molar in a period of 3 to 6 months. The parents should be told of the condition when it is observed, and they should be given an explanation of the possible trend of events. The permanent molar may erupt into normal position, or it may hang on the enamel margin indefinitely. When sufficient time has elapsed to convince the dentist that the permanent molar will not erupt properly, then treatment should be initiated. Experience has taught that a 6-month period of observation from the time the condition was first noted is a good time to pass judgment. If treatment is warranted, take an alginate impression of the maxillary and mandibular arches. After the stone casts have been made, the maxillary cast is prepared for the

construction of an immediate denture replacing the second primary molar that is preventing the first permanent molar from erupting. In removing the second primary molar tooth from the stone cast, a socket should be prepared in the cast in the shape of a tapering cone. This cone-shaped root on the denture will extend into the tissues about one mm. apical to the marginal ridge of the permanent molar as determined from the x-ray. The point of the cone is slightly mesial to the marginal ridge. The acrylic tooth will act as an inclined plane which will guide the eruption of the permanent molar into its proper position. The offending tooth is removed, and the patient is instructed to close the teeth on a gauze sponge until a blood clot is formed. The denture is fitted, and the parents are given instructions as to the intended results and care of the denture.

Premature Loss of Anterior Primary Teeth

Premature loss of anterior primary teeth also presents many problems to the everyday practitioner. The two common causes for the loss of these anterior teeth are trauma and caries. When caries has progressed to the pulp chamber, and the tooth shows evidence of requiring vital pulp therapy, it is good judgment to follow such treatment. However, the chances for successful results are not as good as the same treatment in molars. If periapical infection is detected later, the tooth should be removed from the arch.

Injury to anterior primary teeth gives rise to many problems to the dentist. One's schedule often is interrupted by a call from a mother full of anxiety over an accident involving her youngster. If an injured tooth, according to the judgment of the dentist, has any reasonable chance of surviving, treatment is recommended. Parents should be warned that discoloration may occur approximately two weeks following the accident, but this is not an indication for the removal of the tooth. X-ray examination every two to three months, during the first year after an injury, will give the dentist an opportunity to observe the area for any periapical infection. After a year's time, the tooth may be observed at the regular six-month recall appointments.

Many parents will express great concern over the esthetics resulting from the loss of primary anterior teeth. This concern on the part of the parents is justified. It seems reasonable that these parents should be afforded a replacement, meeting

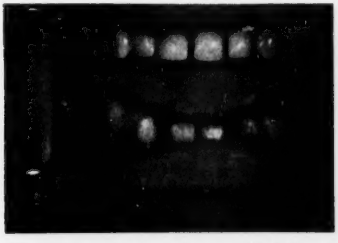

Fig. 13. A photograph of a child five and one-half years of age with a full upper denture. Note the fine esthetics obtained without buccal and labial flanges.

Fig. 14. A four unit anterior bridge for a child three years old.

the esthetic requirements of the one or more lost anterior teeth. The average child should be about three years of age before bridges or dentures can be made successfully. Partial dentures, replacing one or more anterior primary teeth, can bring about very satisfactory esthetics as well as aiding in normal speech and function.

If an anterior bridge is to be used following an injury, sufficient time should elapse to permit an evaluation of the adjacent teeth prior to the preparation of abutment teeth.

The technique of construction of the anterior bridges is too complex to describe in this paper. There are those in the profession who are of the opinion that it is unnecessary to incorporate the expansion element into an anterior bridge, unless a cuspid is used as an abutment. Should this latter opinion be valid, then anterior bridgework for children will be greatly simplified.

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